

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 07 FEB 2006

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Applicant's or agent's file reference DCS/P02126WO/JEC	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. PCT/GB2004/005402	International filing date (day/month/year) 23.12.2004	Priority date (day/month/year) 24.12.2003
International Patent Classification (IPC) or national classification and IPC B21D37/02, B25B11/00, B25B1/24		
Applicant SURFACE GENERATION LTD et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand  20.07.2005	Date of completion of this report  06.02.2006	
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Lasa, A  Telephone No. +49 89 2399-2641	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/005402

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-12 as originally filed

**Claims, Numbers**

1-18 received on 25.10.2005 with letter of 20.10.2005

**Drawings, Sheets**

1/17-17/17 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/005402

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/GB2004/005402

**Re Item V.**

The subject-matter of claims 1-18 is new and inventive.

D1 = WO 02/064308 A discloses the closest prior art from which the tooling system of claim 1 differs in that it comprises bolster means (34) having an element contacting face (68) which is adapted selectively to apply localised pressure to one or more elements of the array.

Such bolster means are not known in the prior art. They allow the tooling system to correct any misalignment of the edges of the elements of the array by applying localised pressure to the elements in order to hold them securely in the closed position.

Thus, the subject-matter of claim 1 is new and inventive.

This is also the case for the subject-matter of claims 2-18, since these claims are dependent on claim 1.

## Claims

1. A tooling system which comprises a plurality of elements arranged in an array, the elements of the array being movable between a closed position in which the elements contact one another and are secured in position, and an open position in which the elements of the array are spaced  
5 apart and are capable of vertical movement relative to one another, characterised in that the tooling system further comprises bolster means provided to hold the elements of the array securely in the closed position and having an element contacting face which is adapted selectively to apply localised pressure to one or more elements of the array.
2. A tooling system according to claim 1 characterised in that the elements of the array are  
10 substantially polygonal in cross section.
3. A tooling system according to claim 2 characterised in that the elements of the array are substantially triangular, rectangular or pentagonal in cross-section.
4. A tooling system according to claim 2 or claim 3 characterised in that the elements of the array are arranged so that, in the closed position of the array, the major axes of adjacent elements  
15 are aligned and their vertices touch one another, so that the elements of the array tessellate.
5. A tooling system according to any of claims 1 to 4 characterised in that the array is substantially rectangular in plan view and bolster means are provided on at least two adjacent sides of the rectangular array.
6. A tooling system according to claim 5 characterised in that bolster means are provided on  
20 all four sides of the rectangular array.
7. A tooling system according to claim 6 characterised in that the outer edges of the rectangular array are serrated and the bolster means has a correspondingly serrated face.

8. A tooling system according to claim 7 characterised in that the face of the bolster means contacting the array is formed from a plurality of teeth, at least some of which teeth are adjustable in order to apply localised pressure selectively to one or more elements of the array, in line with the sides of the elements.

5 9. A tooling system according to claim 8 characterised in that the teeth are also individually adjustable in height relative to one another.

10 10. A tooling system according to any of claims 1 to 9 characterised in that the bolster means comprise two sets of bolsters, the first of which is used during machining of the elements of the tooling system and the second of which is used when the elements of the array have been machined and the system is being used as a mould.

11. A tooling system according to any of claims 1 to 10 characterised in that at least one of the bolster means is formed of two or more separate component sections, so that one or more component sections may be removed to allow opening and adjustment of a part of the array, while maintaining the remainder of the array secured in the closed position.

15 12. A tooling system according to any of claims 1 to 11 characterised in that the bolster means are modular in design, so that individual bolster sides interlock with one another to form larger units.

13. A tooling system according to any of claims 1 to 12 characterised in that it further comprises vibrating means, so that the bolster sides can be vibrated to assist in bedding down the elements of the array.

14. A tooling system according to any of claims 1 to 13 characterised in that it further comprises sensors to detect and measure the forces applied to the elements of the array and /or to detect any movement.

15. A tooling system according to any of claims 1 to 14 characterised in that it further  
5 comprises means for securing the bolster means in position around the array of elements.

16. A tooling system according to any of claims 6 to 15 characterised in that the bolster means comprises four identical bolster components each of which is mounted on a cross rail of the array and guided by a guide rail with which it is in sliding engagement.

17. A tooling system according to claim 16 characterised in that the bolster means is  
10 substantially circular or substantially rectangular.

18. A tooling system according to any of claims 1 to 17 characterised in that the faces of the bolster means which contact the elements of the array are provided with contact pads.